

EWP Pilot Water Acquisitions— Stream Selection Recommendations

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Summary

This report represents the final recommendations of the CALFED Bay-Delta Program (CALFED) Environmental Water Program (EWP) team for the selection and prioritization of streams for the first round of pilot water acquisitions. The report presents information on 12 streams tributary to the Sacramento–San Joaquin River Delta (Delta) that were selected for the first round of pilot acquisitions, which is scheduled for 2003. These 12 streams were selected because the U.S. Fish and Wildlife Service (USFWS), through its draft biological prioritization process, identified them as having the highest priority for instream flow acquisition.

CONSIDERATIONS USED TO RECOMMEND STREAMS FOR ACQUISITION

The EWP team used the factors listed below when it developed the prioritization recommendations. These factors were divided into primary and secondary considerations. The team's primary considerations were

- # streams recommended for instream acquisitions during Stage 1 in the Ecosystem Restoration Program Plan (ERPP) Strategic Plan for Ecosystem Restoration (Strategic Plan),
- # the size of investment in the watershed by the Anadromous Fish Restoration Program (AFRP) and CALFED Program,
- # the number of anadromous salmonid species identified for recovery in the CALFED Multi-Species Conservation Strategy (MSCS) (CALFED Bay-Delta Program 2000) that are present in the stream, and
- # USFWS ranking of biological priority.

The EWP team's secondary considerations were

- # the availability of quantified flow objectives to facilitate recovery of anadromous salmonids,
- # the availability of biological monitoring data, and
- # the existence of active local groups focused on watershed restoration.

PRIORITIZATION OF STREAMS

After applying the considerations, the EWP team grouped the 12 streams into 3 tiers. The CALFED agencies will pursue long-term water acquisitions in the first round on those streams in the first tier. Only 2–3 acquisitions will be made in the first round of acquisitions, so water will not be acquired on all 5 streams. The rankings are as follows:

- # First Tier
 - Butte Creek
 - Clear Creek
 - Deer Creek
 - Mill Creek
 - Tuolumne River

- # Second Tier
 - Battle Creek
 - Big Chico Creek
 - Calaveras River
 - Stanislaus River
 - Yuba River

- # Third Tier
 - Antelope Creek
 - Cow Creek

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EWP Pilot Water Acquisitions—Stream Selection Recommendations

INTRODUCTION

At the November 15, 2001, CALFED Bay-Delta Program (CALFED) Environmental Water Program (EWP) Workshop, the EWP team presented its recommendations for the initial focus of the pilot water acquisitions. At that meeting, workshop participants offered comments and suggestions regarding the recommendations and the methods used to prioritize streams for pilot water acquisitions. The team posted the preliminary report on the EWP website (<http://www.calfedewp.org>) in an effort to seek additional comments and suggestions; none were received by the target date (December 14, 2001). Comments and suggestions made at the November 15 workshop are summarized in appendix A.

At the close of the comment period, the team reviewed the preliminary recommendations with the comments and suggestions in mind. Revisions were incorporated into this final report, as appropriate. This report represents the EWP team's final recommendations for the selection and prioritization of streams for the first round of pilot acquisitions.

BACKGROUND

The CALFED EWP team evaluated the 12 streams identified by the U.S. Fish and Wildlife Service (USFWS) as having the highest biological priorities for flow augmentation. The team used several factors to evaluate and select streams on which to pursue acquisitions during the first round; these factors were divided into primary (most important) and secondary factors. Primary factors considered are as follows:

Streams recommended for instream acquisitions during Stage 1 in the Ecosystem Restoration Program Plan (ERPP) Strategic Plan for Ecosystem Restoration (Strategic Plan).

Prior investment in the watershed. The level of financial investment made by the Anadromous Fish Restoration Program (AFRP) and the CALFED Program was identified as representing the importance these 2 programs place on the watersheds. This investment is also an apparent indicator by the AFRP's and CALFED's technical committees of the potential environmental benefits that could be derived by funding improvements in the watersheds. "Prior investment" was defined as the number of

projects and amount of funding approved, including completed restoration

projects, those in progress, and those approved for funding.

- # **Number of Multi-Species Conservation Strategy (MSCS) species present.** To tie the EWP to the CALFED MSCS, the EWP team determined for each of the 12 streams the number of anadromous salmonid species identified in the MSCS for recovery to levels that ensure the species' long-term survival in nature ("R" species). This assessment closely corresponds to the number of anadromous salmonids present in the stream, both listed and unlisted, under the California or federal Endangered Species Acts (ESAs).
- # **USFWS Draft Biological Priority Ranking.** USFWS has completed a draft ranking of 19 Delta tributary streams based on biological criteria. The 12 streams considered in the selection process represent those identified as having the highest priority for instream acquisition by USFWS (see appendix B for more information on the USFWS biological prioritization process). For purposes of the selection analysis, these top 3 categories are described as A, B, and C:
 - *category A* represents streams that support multiple listed species of anadromous salmonids and that would receive at least 1 ecosystem benefit if water were acquired on that stream;
 - *category B* represents streams that support multiple listed species of anadromous salmonids and would receive at least 1 ecosystem benefit, but that have a hatchery; and
 - *category C* represents those that support multiple species of anadromous salmonids, 1 of which is listed, and that would receive at least 1 ecosystem benefit if water were acquired on that stream.

Secondary factors considered are as follows:

- # **Quantified flow objectives.** Have numerical flow objectives or targets (as defined by the AFRP or Ecosystem Restoration Program [ERP]) been established for this stream?
- # **Biological monitoring data availability.** Are historical biological monitoring data (e.g., population surveys) available to provide baseline information for evaluating scientific hypotheses?
- # **Existence of local groups.** Are local groups (including resource conservation districts) actively engaged in management and recovery of the watershed? Such groups may provide information regarding existing conditions, assist in identifying willing sellers, assist in defining specific scientific hypotheses, and act as partners in implementing acquisitions.

Although the primary factors were considered more important than the secondary factors, there is no priority order within the list of primary and secondary factors considered.

DATA SOURCES AND LIMITATIONS

The EWP team gathered information pertinent to each of these factors by calling agency biologists and watershed group contacts, consulting previously prepared reports, and searching the Internet (see the list of references at the conclusion of this report). The team recognizes that additional information may be available through less obvious channels; although this report represents the final recommendations for the first year of pilot acquisitions, the team welcomes additional verifiable information for future efforts.

The team also recognizes that the information gathered is not complete and that there is some disagreement among experts regarding its interpretation. In particular, opinions differ regarding the presence or absence of particular species in particular streams. The EWP team chose to use the species list provided in appendix E of the Final Restoration Plan for the AFRP, information from the AFRP website, and conclusions reached by USFWS during the Central Valley Project Improvement Act (CVPIA) Section 3406(b)(3) biological prioritization process. All information gathered is available for review on the EWP website (<http://www.calfedewp.org>).

SELECTION PROCESS

The process used to select the first set of streams was based on a logical evaluation of available data. The team did not use modeling or other mathematical methods to rank the streams because it is recognized that such an evaluation would always be somewhat subjective. There is no single right answer regarding the prioritization of streams; others may review the information collected and come to different conclusions. However, the goal of the EWP team was to develop a logical process and to make the information and assumptions used available for review by agency staff and stakeholders. As suggested by the EWP Workshop participants, the team will consider using a weighting system or some other way to compute rankings for selections in subsequent years.

It is important to recognize that these selections are for the *initial* acquisitions by the EWP only; any streams not selected for pilot acquisition through this initial process may be considered by the EWP in the future.

Information gathered about the evaluation factors is summarized in tables 1 and 2. Using this information, the EWP team placed the 12 candidate streams into 3 “tiers.” First-tier streams will be the focus for initial acquisitions, although it should be noted that if appropriate pilot water acquisitions cannot be located on the first-tier streams, second-tier streams will be reconsidered. As described in the pilot water acquisitions draft selection process, the EWP team

Table 1. Information Used to Select Pilot Water Acquisition Program Streams

Stream	Primary Considerations						Secondary Considerations		
	ERPP Strategic Plan Stage 1 Flow Acquisition Recommended	AFRP/CALFED– Funded Restoration Since 1995 ^a		Presence of Anadromous Salmonid Species ^b			Quantified Flow Objectives Exist	Biological Monitoring Data Available	Local Group(s) Actively Involved in Restoration
		Amount Spent	# Projects	# MSCS “R”		USFWS Ranking ^c (A, B, C)			
				Species	# Listed				
Antelope Creek		\$1,187,500	2	3	2	C		?	
Battle Creek	✓	\$35,342,954	17	3	2	B		✓	✓
Big Chico Creek		\$4,261,149	12	3	2	C		✓	✓
Butte Creek	✓	\$12,063,026	34	3	2	A	Yes (all year)	✓	✓
Calaveras River		\$204,000	2	2	1	C	Yes (all year)	✓	✓
Clear Creek	✓	\$4,123,377	6	2	1	C	Yes (all year)	✓	✓
Cow Creek		\$15,000	1	2	1	C	Yes (October)	?	✓
Deer Creek	✓	\$1,061,845	2	3	2	A		✓	✓
Mill Creek	✓	\$4,698,372	14	3	2	A		✓	✓
Stanislaus River		\$7,956,513	14	2	1	C	Yes (all year, year type)	✓	
Tuolumne River	✓	\$25,294,595	25	2	1	C	Yes (all year, year type)	✓	✓
Yuba River		\$1,968,338	13	3	2	A	Yes (all year)	✓	✓

a Does not include AFRP/CALFED projects for which funding information is not available.

b Information on anadromous salmonid species presence taken from appendix E of the *Final Restoration Plan for the Anadromous Fish Restoration Program* (U.S. Fish and Wildlife Service Anadromous Fish Restoration Program 2001) and from the AFRP website. Each anadromous salmonid species identified in the Final Restoration Plan and considered in this process is identified in the CALFED *Multi-Species Conservation Strategy* (MSCS) as one to be recovered “within the MSCS focus area to levels that ensure the species’ long-term survival in nature” (“R”).

c Relative priority as identified through the USFWS CVPIA 3406(b)(3) draft biological prioritization process. A = Category 1b; B = Category 1c; C = Category 2b. See appendix B for documentation of how the streams were prioritized through the CVPIA 3406(b)(3) process.

Table 2. Assumptions Regarding Current Anadromous Salmonid Presence in the 12 Initial Pilot Water Acquisition Program Streams^a

Stream	Species				Total Number	Number Listed	CVPIA 3406(b)(3) Ranking ^b
	Fall/Late-Fall–Run Chinook (federal candidate)	Spring-Run Chinook (federally and state listed as threatened)	Winter-Run Chinook (federally and state listed as endangered)	Steelhead (federally listed as threatened)			
Antelope Creek	✓	✓		✓	3	2	C
Battle Creek	✓	✓	✓ ^c	✓	3	2	B
Big Chico Creek	✓	✓		✓	3	2	C
Butte Creek	✓	✓		✓	3	2	A
Calaveras River	✓			✓	2	1	C
Clear Creek	✓			✓	2	1	C
Cow Creek	✓			✓	2	1	C
Deer Creek	✓	✓		✓	3	2	A
Mill Creek	✓	✓		✓	3	2	A
Stanislaus River	✓			✓	2	1	C
Tuolumne River	✓			✓	2	1	C
Yuba River	✓	✓		✓	3	2	A

^a Information taken from appendix E of the *Final Restoration Plan for the Anadromous Fish Restoration Program* (U.S. Fish and Wildlife Service Anadromous Fish Restoration Program 2001) and the AFRP website (www2.delta.ca.gov/afrp).

^b Relative priority for instream acquisition as identified through the USFWS CVPIA 3406(b)(3) draft biological prioritization process. A = Category 1b; B = Category 1c; C = Category 2b. See appendix B for documentation of how the streams were prioritized through the CVPIA 3406(b)(3) process.

^c Winter-run chinook salmon in Battle Creek are of hatchery origin. Since this run is not native to the stream, it is not considered in the total number and the number of listed species present.

will pursue up to 3 long-term acquisitions in the first year. Accordingly, water will not be acquired on all streams in the first tier during the first year of implementation. Also, the EWP team intends to complete 1 of the initial acquisitions in partnership with another program such as the EWA or CVPIA Water Acquisition Program; this joint acquisition may not focus on the first-tier streams.

RECOMMENDATIONS

The following 5 streams are recommended for placement in the first tier:

- # Butte Creek,
- # Clear Creek,
- # Deer Creek,
- # Mill Creek, and
- # the Tuolumne River.

The following streams are ranked in the second tier:

- # Battle Creek,
- # Big Chico Creek,
- # the Calaveras River,
- # the Stanislaus River, and
- # the Yuba River.

The following streams are ranked in the third tier:

- # Antelope Creek and
- # Cow Creek.

The listings are in alphabetical order; there is no priority within each tier. The succeeding text describes the reasoning used in each recommendation.

First-Tier Streams

All first-tier streams are recommended in the ERPP Strategic Plan for flow augmentation during Stage 1, a primary consideration factor. Three of the 5 streams support 3 MSCS “R” species, 2 of which are listed pursuant to the California and/or federal ESA. These same 3 streams were included by USFWS in category A for instream acquisition through the CVPIA 3406(b)(3) draft biological prioritization process. The remaining 2 streams support 1 listed species and were included in category C. In most cases, the AFRP and CALFED Program have invested a substantial amount of money and effort on improving habitat for anadromous fish on first-tier streams.

Butte Creek

Butte Creek is identified for flow acquisition in the Strategic Plan, and USFWS placed it in category A. Because of considerable local interest as well as that of the AFRP and CALFED Program, there is a great deal of baseline information, including a minimum flow recommendation. This makes the stream a fitting location to test scientific and institutional hypotheses associated with supplementing flow. Butte Creek also supports 3 anadromous salmonids identified in the MSCS for recovery, 2 of which are listed pursuant to the California and/or federal ESAs.

Clear Creek

USFWS placed Clear Creek in category C (the creek supports only 1 listed species of anadromous salmonids [steelhead]); however, Clear Creek is placed in the first tier because the stream is recommended for flow acquisition in the Strategic Plan, 2 species of anadromous salmonids identified for recovery in the MSCS are present in the stream, and both the AFRP and CALFED Program have invested considerable money and effort in restoring the stream. Additionally, the stream has year-round quantified flow objectives, there are sufficient population and monitoring data, and there is active local support for restoration.

Deer Creek

Deer Creek is identified for flow acquisition in the Strategic Plan, and USFWS placed it in category A. Local groups, AFRP, and the CALFED Program have invested a fair amount of money and effort into restoration of the stream. Although quantified flow objectives do not yet exist for Deer Creek, the creek supports 3 species of anadromous salmonids identified for recovery in the CALFED MSCS (2 of which are listed pursuant to the California and/or federal ESAs), there are sufficient population and monitoring data, and there are active local groups focused on restoring the creek.

Mill Creek

Mill Creek is identified for flow acquisition in the Strategic Plan, and USFWS placed it in category A. Although quantified flow objectives do not yet exist for Mill Creek, the creek supports 3 species of anadromous salmonids identified for recovery in the CALFED MSCS (2 of which are listed pursuant to the California and/or federal ESAs), there are sufficient population and monitoring data, and there are active local groups focused on restoring the creek.

Tuolumne River

USFWS placed the Tuolumne River in category C (the river supports only 1 species of anadromous salmonids listed pursuant to the federal ESA [steelhead]); however, the river is

recommended for placement in the first tier because it is identified as a target for instream acquisition in the Strategic Plan, quantified year-round flow objectives for different year types are available, and AFRP and the CALFED Program have invested considerable money and effort in improving habitat for anadromous fish species in the river.

Second-Tier Streams

In general, streams recommended for placement in the second tier are those about which there is some information and local interest, but that were excluded from the first tier for specific reasons. These reasons are explained below. The EWP team recognizes that there may be some opportunities to apply and test on all these second-tier streams various scientific and institutional hypotheses associated with supplementing flow.

Most second-tier streams received similar ratings with regard to the primary considerations. With the exception of Battle Creek, streams recommended for placement in the second tier are not identified for flow acquisition in the Strategic Plan. USFWS placed 3 of the 5 second-tier streams in category C; it placed the remaining 2 streams, the Yuba River and Battle Creek, in categories A and B, respectively.

Battle Creek

Battle Creek supports 3 species of anadromous salmonids identified for recovery in the CALFED MSCS. Although 2 of these species are listed pursuant to the California and/or federal ESAs, USFWS placed Battle Creek in category B because of the presence of Coleman National Fish Hatchery.

The AFRP, the CALFED Program, a private company (Pacific Gas & Electric Company [PG&E]), and local entities are currently placing a substantial emphasis on improving conditions for anadromous fish in Battle Creek. PG&E has agreed to provide minimum flows on an interim basis, as negotiated with the U.S. Bureau of Reclamation, USFWS, the National Marine Fisheries Service (NMFS), and the California Department of Fish and Game (DFG). It is expected that the current planning effort will include identification and acquisition of permanent minimum base flows for salmonid recovery in Battle Creek. Accordingly, a flow acquisition by the EWP is not likely to be necessary; it is for this reason that Battle Creek is placed in the second tier.

Big Chico Creek

Although DFG has recently started regular monitoring of the creek and there are at least 2 active local groups, Big Chico Creek is recommended for placement in the second tier because it is not recommended for flow acquisition in the Strategic Plan and lacks quantified flow objectives. USFWS placed it in category C, although the creek supports 3 anadromous salmonid

species identified for recovery in the CALFED MSCS (2 of which are listed pursuant to the California and/or federal ESAs). (The AFRP Final Restoration Plan identifies the presence of 2 listed species of anadromous salmonids in Big Chico Creek [spring-run chinook salmon and steelhead], but the CVPIA 3406(b)(3) process considered the presence of only 1 sustainable population of a listed species.) The team recognizes that Big Chico Creek is the subject of local interest and that both the AFRP and the CALFED Program have invested at least \$4 million in restoration.

Calaveras River

Although the AFRP has identified year-round flow objectives, there has been little AFRP- or CALFED Program-supported restoration on the Calaveras River. The river supports 2 species of anadromous salmonids identified for recovery in the CALFED MSCS, but it supports only 1 listed species; USFWS placed the Calaveras River in category C. The river is the subject of only limited biological monitoring. No active local interest in restoration of the Calaveras River has been identified.

Stanislaus River

Year-round flow objectives by year type are included in both the AFRP and ERPP, and historic monitoring and population data are available for the Stanislaus River. Although the AFRP and the CALFED Program have invested a moderate amount of money in restoring the Stanislaus River, local interest in restoring the Stanislaus River does not appear to be substantial (the EWP team could not identify any local groups with the express interest in restoration of anadromous fisheries in the Stanislaus River). Although the Stanislaus River supports 2 species of anadromous salmonids identified for recovery in the CALFED MSCS, only 1 of those species is listed, and USFWS placed the river in category C.

Yuba River

The Yuba River supports 3 species of anadromous salmonids identified for recovery in the CALFED MSCS, and USFWS placed it in category A (the river supports 2 listed species). There is an abundance of background information about the Yuba River, including year-round quantified flow objectives and regular monitoring. Although the AFRP and the CALFED Program have not invested a substantial amount of money and effort into restoration of the Yuba River, there is active local interest in restoring the river's anadromous populations. Nevertheless, the Yuba River is identified for placement in the second tier because it is not recommended for acquisitions in the Strategic Plan and because preliminary modeling indicates that the most important flow needs identified by the AFRP are being met through existing operations.

Third-Tier Streams

Two streams, Antelope Creek and Cow Creek, are recommended for placement in the third tier. Neither stream is recommended for flow acquisition in the Strategic Plan, and it is uncertain whether any population monitoring is taking place in either stream or whether there are any reliable data about historical populations. USFWS placed both streams in category C because each stream supports only 1 federally listed species of anadromous salmonids. Finally, the AFRP and the CALFED Program have not invested a substantial amount of money or effort into restoration of Antelope and Cow Creeks.

Antelope Creek

Neither the AFRP nor the CALFED ERPP have identified quantified flow objectives for Antelope Creek, and no local groups appear to be active. Before the EWP considers acquisitions on this stream, it may be prudent for 1 of the active restoration-focused programs (AFRP, ERP, Watershed Program) to apply funding in support of monitoring, the identification of flow objectives, and the development of a local watershed group.

Cow Creek

Although there is a quantified flow objective for Cow Creek, it is only for the month of October. No population monitoring has been identified. There is a newly formed Cow Creek watershed group, and the State Water Resources Control Board is sponsoring a watershed assessment. However, before the EWP considers acquisitions on Cow Creek, it may be prudent for one of the active restoration-focused programs (AFRP, ERP, Watershed Program) to apply funding in support of monitoring and the identification of year-round flow objectives for the stream.

References Used in Assembling Information for 12 Streams

PRINTED REFERENCES

- CALFED Bay-Delta Program. 2000. *Ecosystem Restoration Program Plan. Part of the final programmatic environmental impact report/environmental impact statement for the CALFED Bay-Delta Program.* Sacramento, CA.
- CH2M Hill. 2001. *Draft summary and results of the CVPIA 3406(b)(3) flow acquisition biological prioritization process.* Special technical memorandum prepared for the U.S. Fish and Wildlife Service.
- U.S. Fish and Wildlife Service Anadromous Fish Restoration Program. 1996. *Draft guidelines for allocation of water acquired pursuant to Section 3406(b)(3) of the Central Valley Project Improvement Act.* Prepared for distribution at a public workshop October 22, 1996.
- . 2001. *Final restoration plan for the Anadromous Fish Restoration Program.* Prepared for the Secretary of the Interior under authority of the Central Valley Project Improvement Act.

PERSONAL COMMUNICATIONS

- Costillo, Gonzalo. California Department of Fish and Game. October 25, 2001—information provided electronically to Jones & Stokes.
- Harvey, Colleen Arrisson. California Department of Fish and Game. October 25, 2001—email to Tanya Matson of Jones & Stokes regarding DFG monitoring efforts.
- Heiman, Dennis. State Water Resources Control Board. October 24, 2001—email to Selene Jacobs of Jones & Stokes regarding Antelope and Cow Creeks.
- McReynolds, Tracy. California Department of Fish and Game. October 24, 2001—telephone conversation with Susan Lee of Jones & Stokes regarding Big Chico Creek.
- Nelson, John. California Department of Fish and Game. October 19, 2001—telephone conversation with Susan Lee of Jones & Stokes regarding Butte Creek, Big Chico Creek, the Yuba River, and the Calaveras River.

Rectenwald, Harry. California Department of Fish and Game, Region 4. October 30, 2001—telephone conversation with Selene Jacobs of Jones & Stokes regarding Cow, Clear, and Battle Creeks.

Roby, Ken. U.S. Forest Service, Lassen National Forest. October 29, 2001—telephone conversation with Selene Jacobs of Jones & Stokes regarding Antelope Creek.

Ward, Paul. California Department of Fish and Game, Region 2. October 23, 2001—telephone conversation with Susan Lee of Jones & Stokes regarding Butte Creek.

INTERNET WEBSITES

Anadromous Fish Restoration Program Website: <<http://www2.delta.dfg.ca.gov/afrp/afrp.asp>>

Butte Creek Watershed Conservancy Website: <<http://www.buttecreekwatershed.org/>>

CALFED Bay-Delta Program Ecosystem Restoration Program Website:
<http://wwwcalfed.water.ca.gov/ecosystem_rest.html>

CALFED Bay-Delta Program Watershed Program Website:
<<http://www.baydeltawatershed.org/>>

Comprehensive Assessment and Monitoring Program Website:
<<http://www2.delta.dfg.ca.gov/camp/>>

Dr. Paul Maslin's Website: <<http://www.csuchico.edu/~pmaslin/>>

The David and Lucile Packard Foundation (grants awarded) Website:
<<http://www.packfound.org/>>

Proposition 117 Habitat Conservation Fund Projects Website:
<<http://www.mountainlion.org/Habitat/Prop117Intro.html>>

U.C. Davis Information Center for the Environment: <<http://ice.ucdavis.edu/>>

Western Shasta Resource Conservation District Website: <<http://westernshastarcd.org>>

**Appendix A. Summary of Comments on the
Preliminary Pilot Water Acquisitions—Stream
Selection Recommendations**

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Comment:

The number of listed species present in a stream should be a primary consideration factor, not secondary.

Response:

The number of listed species present in a stream was captured to some extent within the U.S. Fish and Wildlife Service (USFWS) draft biological priority ranking, which was a primary consideration. The total number of salmonid species present (both listed and unlisted) was also included as a secondary factor (the number of anadromous species identified for recovery by the CALFED Bay-Delta Program [CALFED] Multi-Species Conservation Strategy [MSCS]). Because the Environmental Water Program (EWP) is a CALFED project, the EWP considered it more appropriate to tie priority to the MSCS than simply to identify listed species, although as table 1 shows, there is a great deal of overlap. The number of listed species was not explicitly a consideration factor, but it has been added to the discussion of each stream and remains embedded in the USFWS draft biological prioritization categorization.

The team recognizes that there are differences of opinion regarding which species, both listed and unlisted, are present in each stream. Information regarding species presence was taken from the Final Restoration Plan for the Anadromous Fish Restoration Program (AFRP), the AFRP website, and the draft summary of the Central Valley Project Improvement Act (CVPIA) Section 3406(b)(3) prioritization process (appendix B). In some cases, the information provided in the AFRP and on the AFRP website does not correspond to considerations used in the CVPIA Section 3406(b)(3) process. Where this is the case, the team deferred to the AFRP species list.

Comment:

The presentation given at the November 15, 2001, EWP Work Group meeting indicated that Battle Creek received the same CVPIA 3406(b)(3) ranking as Butte Creek, Deer Creek, Mill Creek, and the Yuba River. However, Battle Creek was in actuality ranked lower than these streams because of the presence of a hatchery. Also, the number of species Battle Creek supports needs clarification.

Response:

Although the presentation contained a mistake, the written preliminary recommendation report correctly characterized Battle Creek as receiving a lower rank than Butte Creek, Deer Creek, Mill Creek, and the Yuba River. According to the Final Restoration Plan for the AFRP, Battle Creek supports fall-/late fall-run chinook salmon, spring-run chinook salmon, winter-run chinook salmon, and steelhead, although the winter-run chinook salmon is of hatchery origin. In the preliminary recommendations, winter-run chinook was included in the number of species present in the stream. However, for these final recommendations, winter-run is not included because it does not occur naturally.

Comment:

It is unclear why CALFED and AFRP funding was used as a selection factor; spending in itself is not a good indicator of priority. The discussion of this consideration needs clarification.

Response:

Money spent is used as an indicator of the importance placed on a stream by the CALFED agencies and CVPIA managers; similarly, funding recommendations by technical panels imply that investment in selected streams is likely to result in biological and scientific benefit.

Comment:

The Tuolumne River and Clear Creek should not be first-tier streams because they do not support listed salmon species.

Response:

The Final Restoration Plan for the AFRP indicates that both Clear Creek and the Tuolumne River support 2 MSCS “R” species: fall-/late fall-run chinook salmon and steelhead. Of these species, steelhead is listed pursuant to the federal Endangered Species Act. Steelhead is an anadromous salmonid species. Fall-/late fall-run chinook salmon are listed as candidate species. NMFS will develop recovery recommendations in their federal recovery plan.

Comment:

Conjunctive use opportunities should be used as a selection consideration.

Response:

Opportunities to create partnerships with conjunctive use programs are being considered within the context of a partnership with the Environmental Water Account. Other opportunities for partnerships with conjunctive use projects will also be considered in future rounds of pilot water acquisitions.

Comment:

The EWP team should consider weighting evaluation factors to develop a calculated (and more defensible) selection process.

Response:

As the EWP team collected and analyzed the baseline data that support the selection considerations, it tested several different methods through which it might prioritize the 12 streams. Because the team recognized that the data were in many cases not complete, it decided that, for this first year, a subjective process was more appropriate. The team recognizes that the selection process is likely to differ in future years; when those future processes are developed, the team will evaluate the potential for using a weighting system or some other measurable process.

Comment:

The availability of storage should be a selection consideration.

Response:

The EWP team recognizes that there are many considerations that could have been used for this first selection. Once the first-tier streams are selected, the EWP team will contemplate more detailed considerations, such as the availability of storage, and how that relates to the volume of water needed, on each of the first-tier streams.

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Comment:

CH2M Hill's August 22, 2001, memo on the CVPIA Section 3406(b)(3) process should be appended to the EWP selection recommendations paper.

Response:

The memo is included as appendix B.

Comment:

In the preliminary report, the language of the last sentence of the third paragraph under “Selection Process” on page 2 should be changed; suggest replacing the word “committed” with another word. “Committed” implies some sort of statutory or other authority to complete the action.

Response:

As discussed at the November 15, 2001, workshop, this word was used with the intent to convey the team’s resolve to strive for success in implementing the EWP. The text has been revised.

**Appendix B. Draft Summary of the Central Valley Project
Improvement Act Section 3406(b)(3) Prioritization Process**

Draft Summary and Results of the CVPIA 3406 (b)(3) Flow Acquisition Biological Prioritization Process

PREPARED FOR: Mike Tabault/USFWS
Dick Jewell/USFWS
Andy Hamilton/USFWS

PREPARED BY: Kathy Freas/CH2M HILL
Dick Daniel/CH2M HILL

DATE: August 22, 2001

Summary

This draft memorandum provides a summary of the process and results of a multi-year effort undertaken by Department of Interior and their consultant, CH2M HILL, other agencies, and stakeholders to develop and implement a system to acquire water for restoration of anadromous fish populations in accordance with the Central Valley Project Improvement Act (CVPIA) subsection 3402 (b)(3). The process and results are herein referred to as the (b)(3) acquisition program.

Four workshops were held in 2000 and 2001 to develop and implement a process for prioritizing tributaries to the Sacramento and San Joaquin rivers for flow acquisition. Participants in the fourth workshop of the (b)(3) acquisition program ranked 19 tributaries to the Sacramento and San Joaquin rivers for instream flow acquisition based on biological criteria. Tributaries considered include Feather, Bear, Yuba, American, Mokelumne, Calaveras, Stanislaus, Tuolumne, Cosumnes, and Merced rivers; Battle, Mill, Deer, Butte, Cow, Big Chico, Cottonwood, Big Chico, Antelope, and Clear creeks.

It is important to note that these rankings are draft and are the result of discussion and focused assessment of acquisition priorities by agency and stakeholder biologists. As such, they are intended to be used for general guidance only and in conjunction with a set of several spreadsheet models that have been developed to provide more quantitative guidance for acquisition of desirable flows on regulated tributaries and economic criteria being developed. *For tributaries for which spreadsheet models exist, no acquisitions should be planned based on the rankings below until model predictions of flow needs are consulted.* * indicates tributaries for which spreadsheet models are available.

Tributaries were ranked as follows based on species and ecosystem (biological) benefit criteria:

- 1a: multiple listed species, > 1 ecosystem benefit
No tributaries are included in this ranking
- 1b: multiple listed species, ≤ 1 ecosystem benefit
Mill Creek, Deer Creek, Butte Creek, Yuba River*

- 1c: 1a or 1b, hatchery present
Battle Creek
- 2a: multiple species, 1 listed, > 1 ecosystem benefit
No tributaries are included in this ranking
- 2b: multiple species, 1 listed, ≤ 1 ecosystem benefit
Clear Creek, Antelope Creek, Cow Creek, Big Chico Creek,
Calaveras River, Stanislaus River*, Tuolumne River*
- 2c: 2a or 2b, hatchery present
Feather River*, American River, Mokelumne River*, Merced River*
- 3a: 1 listed species, > 1 ecosystem benefit
No tributaries are included in this ranking
- 3b: 1 listed species, ≤ 1 ecosystem benefit
No tributaries are included in this ranking
- 3c: 3a or 3b, hatchery present
No tributaries are included in this ranking
- 4a: multiple species, none listed
No tributaries are included in this ranking
- 4b: 1 species, none listed
Cottonwood Creek
Cosumnes River
Bear River

Decisions regarding acquisitions among tributaries ranked within a category could be based on additional biological information, some of which is included in Table 1 of this document, and economic considerations. This ranking is intended to be dynamic and should be updated as conditions change, particularly as habitat restoration programs on individual tributaries change the value of acquired flows. Additionally, a systematic effort to develop within-tributary desired fish flows [similar to those for regulated tributaries included in the October 1996 memo (USFWS, 1996)] for nonregulated tributaries is desirable to direct amounts and timing of acquisition for these tributaries. Currently, all 1b ranked tributaries and the majority of 2b ranked tributaries lack defined incremental within-tributary desired fish flows.

Background

Subsection 3406 (b)(3) of the CVPIA directs Interior to develop and implement a program for acquisition of instream flows to supplement (b)(2) CVP dedicated yield for anadromous fish restoration and to provide level 4 water for National Wildlife Refuges. The Bureau of Reclamation (Reclamation) annually contracts with willing sellers to acquire instream flows on tributaries for anadromous fish restoration purposes. The acquisition program has limited funds available, thus purchase on tributaries where flow provides greatest benefit to anadromous fish populations is critical to the success of restoration efforts.

In 1998, Interior initiated a program to systematically assess acquisition priorities based on several conditions: hydrologic and operational conditions and the degree to which they

meet fish flow needs, economic conditions that affect acquisition, and biological priorities among tributaries to meet CVPIA goals.

Hydrologic and Operational Conditions

In 1998 and 1999, the USFWS, working with CH2M HILL, compiled hydrologic and operational information for major tributaries to the Sacramento and San Joaquin rivers on which flows might be available for purchase from willing sellers. Information from these compilations was used to develop spreadsheet models of hydrology and operations in various water year types for those tributaries with impoundments. Using this information, spreadsheet models of hydrologic conditions for a range of water year types, and operations have been developed for six basins, the Yuba, Feather, Mokelumne, Stanislaus, Tuolumne, and Merced rivers.

The premise of the spreadsheet models is comparison of existing flows provided by hydrology and operations, with desired flows identified for anadromous fish populations by the USFWS for the CVPIA Programmatic Environmental Impact Statement (USFWS, 1996). In that document, these desired flow amounts were identified as priorities or "packets" of flow on each tributary (typically, Priorities 1-20 to 23, not to be confused with priorities among tributaries) associated with months corresponding to various life stages of anadromous fish species. The spreadsheet models allow desired fish flows to be compared to flows present as a consequence of hydrology and operations to identify the degree to which fish flow priorities are met by existing conditions. The difference in amount and seasonal distribution between desired fish flows and those met by existing hydrology and operations can be used to assess the amount of flow that might be deemed appropriate for acquisition.

No spreadsheet models have been developed for tributaries on which no control structures exist because desired flows corresponding to life stages of targeted species have not been developed and the opportunity to acquire instream flows from willing sellers on such tributaries is limited to water rights acquisitions. No spreadsheet model has been developed for the American River, based on an earlier decision to rely on the Sacramento Water Forum process for acquisitions on that tributary and other existing planning efforts.

Economic Considerations

CVPIA subsection 3406 (b)(3) directs that the water acquisition program will specifically address how the Secretary intends to use (1) "improvements in or modification of project operations, water banking, conservation, transfers, conjunctive use, and temporary and permanent land fallowing, including purchase, lease, and option of water, water rights, and associated agricultural lands." As part of the (b)(3) acquisition program development, economic strategies necessary to maximize the effectiveness of the funds available for purchasing flows and approaches to develop the financial tool best suited to assist in acquisitions have been identified. Based on these considerations, an economic approach that is coordinated with biological priorities and hydrologic and operational conditions will be refined.

Biological Priorities

The cost for purchase of desirable flow priorities that might be targeted for acquisition far exceeds available funds in Interior's acquisition program. To guide acquisition that would result in the greatest biological benefit to anadromous fish populations, Interior initiated an effort to develop an open, systematic process by which consensus on stream prioritization could be reached among knowledgeable biologists.

From August 2000 through July 2001, four workshops were conducted to develop this process and apply it to prioritize tributary streams for instream flow acquisition. Workshops included participants from state and federal agencies, consultants, and stakeholders knowledgeable about conditions and limiting factors for anadromous fish on the tributaries in question and throughout the Sacramento and San Joaquin basins.

Tributary Prioritization Process

The process was focused on developing consensus on a prioritized list of streams on which flows should be purchased to achieve the goal of CVPIA 3406(b)(1). That goal is to implement a program that makes all reasonable efforts to ensure that by 2002 natural production of anadromous fish in Central Valley rivers and streams will be sustainable on a long term basis, at levels not less than twice the average levels attained during the period of 1967-1991. Initial workshop discussions identified a desire to prioritize streams for acquisitions based on maintenance of ecosystem processes as potentially distinct from the "fish doubling" goal. To the degree that anadromous salmonids targeted by this program are indicators of the status of ecosystem function in the Sacramento and San Joaquin basins (and participating biologists discussed and largely agreed that they are such indicators), maintenance of ecosystem processes also was and is a consideration and goal of this prioritization process.

The process to prioritize tributaries for acquisition initially was conceived as a series of questions, the answers to which lead to rankings for each tributary. These questions ultimately were phrased as follows (please consult meeting notes distributed following previous workshops for details on the evolution of these process questions):

- 1) Are 1996 Guideline flow priorities, or desirable flows for streams not included in the Guidelines, met by existing flows?

If "Yes": No Acquisition

If "No": Go to question 2 to evaluate the need to acquisition

- 2) Are there limiting factors that preclude benefits from increased flows at this time?

If "Yes": No acquisition at this time. Continue investments in physical habitat restoration to get to "No."

If "No": Go to question 3

- 3) Will a single or multiple species benefit from acquisitions?

- 4) If multiple listed species, > 1 ecosystem benefit: 1a priority tributary
- If multiple listed species, \leq 1 ecosystem benefit: 1b priority tributary
- If 1a or 1b and a hatchery is present: 1c priority tributary

If multiple species, 1 listed, > 1 ecosystem benefit: 2a priority tributary
 If multiple species, 1 listed, \leq 1 ecosystem benefit: 2b priority tributary
 If 2a or 2b and a hatchery present: 2c priority tributary

If 1 listed species, > 1 ecosystem benefit: 3a priority tributary
 If 1 listed species, \leq 1 ecosystem benefit: 3b priority tributary
 If 3a or 3b and a hatchery present: 3c priority tributary

If multiple species, none listed: 4a priority tributary
 If 1 species, none listed : 4b priority tributary

During workshop four, held on 11 July 2001, these questions were used by two breakout groups to independently rank 19 tributaries to the Sacramento and San Joaquin rivers.

Tributary Prioritization Results

Consensus between the two breakout groups on tributary ranking is as follows based on these species and ecosystem benefit criteria:

- 1a: multiple listed species, > 1 ecosystem benefit
 - No tributaries are included in this ranking
- 1b: multiple listed species, \leq 1 ecosystem benefit
 - Mill Creek, Deer Creek, Butte Creek, Yuba River*
- 1c: 1a or 1b, hatchery present
 - Battle Creek
- 2a: multiple species, 1 listed, > 1 ecosystem benefit
 - No tributaries are included in this ranking
- 2b: multiple species, 1 listed, \leq 1 ecosystem benefit
 - Clear Creek, Antelope Creek, Cow Creek, Big Chico Creek, Calaveras River, Stanislaus River*, Tuolumne River*
- 2c: 2a or 2b, hatchery present
 - Feather River*, American River, Mokelumne River*, Merced River*
- 3a: 1 listed species, > 1 ecosystem benefit
 - No tributaries are included in this ranking
- 3b: 1 listed species, \leq 1 ecosystem benefit
 - No tributaries are included in this ranking
- 3c: 3a or 3b, hatchery present
 - No tributaries are included in this ranking
- 4a: multiple species, none listed
 - No tributaries are included in this ranking
- 4b: no listed species
 - Cottonwood Creek
 - Cosumnes River
 - Bear River

In addition to ranking, considerable detailed information on each of the tributaries was collected from workshop participants to create a record of the process and results to substantiate the rankings, provide information to guide acquisition among tributaries within a rank, and potentially guide collection of additional information to further refine future ranking efforts. This information for individual tributaries is include in Table 1.

TABLE 1
Draft Tributary Rankings for 19 Tributaries to the Sacramento and San Joaquin Rivers

Tributary		Race or Species of Concern	Stream Reach of Concern	Period or Life History of Concern	Benefits From Flow Acquisition						Other	
Name	Priority				Genetic Diversity	Adult Passage	Temperature	Production	Channel Maintenance	Cumulative Benefits	General Ecosystem Riparian	Hatchery?
Clear Creek	2b	Fall run Chinook, remnant Spring run Chinook and Steelhead trout	Foothill reach temperatures	Summer holding habitat for adult Spring run and juvenile Steelhead. Spring run spawning temperature from September through October. Juvenile out migration for Fall run, Spring run, and Steelhead are concerns during April through June	X	X		X	X	X	X	No
Cottonwood Creek	4b (Low priority due to questions about presence of Spring run and Steel-head)	Fall run Chinook, remnant Spring run Chinook, and Steelhead trout	The valley floor reach	Up stream migration and passage and temperature for adult Spring run are a concern during April through June. Down stream juvenile out-migration for Fall and Spring run, and Steelhead are a concern from April through June. Spring run passage at Red Bluff Diversion Dam is an issue.								No
Battle Creek	1c (Priority lowered due to hatchery)	Fall run Chinook, Spring run Chinook, Steelhead trout and possibly a remnant Winter run component	Both the foothill and valley floor reaches	Summer holding period for adults and juvenile rearing are life stages of concern, this is May through October of below normal years. All life history stages are identified in the PG&E MOU. The predominant benefit is April through October in all water year types. There is a need to define or establish flow and temperature objectives and relationships.	X		X	X	X	X	X	Yes
Mill Creek	1b	Fall run Chinook, Spring run Chinook, Steelhead trout	The valley floor reach	Down stream migration is facilitated through existing hydrology from November through May. Flow and temperature objectives and relationships need to be determined.	X	X		X		X	X	No
Deer Creek	1b	Fall run Chinook, Spring run Chinook, Steelhead trout	The valley floor reach	Down stream migration is a function of existing hydrology from November through May. Flow and temperature objectives and relationships need to be determined.	X	X		X		X	X	No
Antelope Creek	2b	Fall run Chinook, remnant Spring run Chinook, Steelhead trout	The valley floor reach	Spring run adult upstream migration and passage and water temperatures are a concern in April through June of below normal years. Fall run, Spring run, and Steelhead downstream migration of juveniles is a concern from April through June. Diversion and entrainment issues are a concern. Flow and temperature objectives and relationships need to be determined. Water sources exist although there is no storage.		X	X					No
Cow Creek	2b	Fall run Chinook, remnant Spring run Chinook, Steelhead trout	The valley floor reach	Spring run adult upstream migration and passage and water temperatures are a concern in April through June of below normal years. Fall run, Spring run and Steelhead juvenile downstream migration is a concern from April through June. There are fish ladder issues of concern. The PG&E Diversion bypass is an issue. Flow and temperature objectives and relationships need to be determined. Water sources exist but storage does not		X	X					No

TABLE 1
Draft Tributary Rankings for 19 Tributaries to the Sacramento and San Joaquin Rivers

Tributary					Benefits From Flow Acquisition							Other
Name	Priority	Race or Species of Concern	Stream Reach of Concern	Period or Life History of Concern	Genetic Diversity	Adult Passage	Temperature	Production	Channel Maintenance	Cumulative Benefits	General Ecosystem Riparian	Hatchery?
Big Chico Creek	2b	Fall run Chinook, Spring run Chinook, Steelhead trout, and non-natal rearing for Winter run Chinook	The valley floor reach	Spring run and Steelhead adult migration and habitat during May and June are a concern. There are no apparent water sources, no diversions, no storage and limited run off.			X					No
Butte Creek	1b	Fall run Chinook, Spring run Chinook, Steelhead trout	The valley floor reach	Up stream adult migration and passage are an issue for Spring run for April through June. Downstream migration for all races and species is a concern from May through June. Yearling Spring run are a concern from September through November. Existing hydrology is adequate from December through March. Flow and temperature objectives and relationships need to be determined	X	X	X	X	X		X	No
Yuba River	1b	Fall run Chinook, Spring run Chinook, Steelhead trout	The valley floor reach, below Englebright Dam	Spring run upstream migration and temperature during May and June of Dry Years is a concern. For Steelhead, summer juvenile rearing flows from June through September is a concern, depending on Daguarre Dam operations. Fall run and Steelhead spawning habitat and temperature are a concern from October through February. The Yuba River is looked upon as a production stream under the AFRP doubling goals. Improved Yuba River flows would generate ancillary benefits for sturgeon. There is a spreadsheet model for the Yuba River	X		X	X		X		No
Feather River	2c (Priority lowered due to hatchery)	Fall run Chinook, Steelhead trout, and hatchery influenced Spring run Chinook	The valley floor reach is the area of concern, primarily the area of the low flow reach below the Dam and above the after bay outlet	Summer holding temperatures and flows are a concern for Spring run during June through September of dry years. Steelhead juvenile rearing is a concern in all water years from June through September. Fall run spawning flows are a concern from October through December of all water years. Steelhead habitat is limited from November through February. The Feather River is a State Water Project stream. There is a spreadsheet model for the Feather River.			X					Yes
Bear River	4b	Fall run Chinook	The valley floor reach below Camp Far West Reservoir	Upstream passage and available spawning habit and temperature are concerns from October through January. Downstream migration is a concern from April through June. Juvenile rearing flows are a concern from February through March.		X	X		X		X	No
American River	2c (Priority lowered due to hatchery)	Fall run Chinook, Steelhead trout	The valley floor reach	Steelhead summer rearing temperatures are a concern in all water year types. June through September of normal and below years are greatest concern. Fall run spawning habitat and temperature area concern from October through December; for Steelhead and spawning habitat concern is November through March. The American River is a CVPIA stream and b(2) water is available. The issues on the American River are being addressed by the Water Forum			X	X				Yes

TABLE 1
Draft Tributary Rankings for 19 Tributaries to the Sacramento and San Joaquin Rivers

Tributary					Benefits From Flow Acquisition							Other
Name	Priority	Race or Species of Concern	Stream Reach of Concern	Period or Life History of Concern	Genetic Diversity	Adult Passage	Temperature	Production	Channel Maintenance	Cumulative Benefits	General Ecosystem Riparian	Hatchery?
Cosumnes River	4b	Fall run Chinook	The valley floor reach	The period of concern is September through December of all but the wetter years. Upstream passage over barriers is the principal issue for Fall run Chinook		X	X		X		X	No
Mokelumne River	2c (Priority lowered due to hatchery)	Fall run Chinook, Steelhead trout	The valley floor reach below Camanche Dam	Fall run adult passage and spawning habitat is a concern from September through December. Steelhead holding and rearing is a concern throughout the summer months. Fall run and Steelhead juvenile out-migration is a concern April through June. There is a spread sheet model for the Mokelumne River. East Bay Municipal Utility District is managing restoration of the Mokelumne River			X	X	X	X	X	Yes
Calaveras River	2b	Fall run Chinook, Steelhead trout	The valley floor below Belota Weir	Fall run upstream migration and passage is a concern from October through January. Fall run and steelhead juvenile out-migration is a concern from February through June.	X	X	X			X		No
Stanislaus River	2b	Fall run Chinook, Steelhead trout	The valley floor reach	Fall run adult migration is a concern from October through January of all but wet years. Fall run downstream migration is a concern from April through June of dry years. Steelhead summer rearing temperatures are a concern from July through September in most years. The Stanislaus River is a CVPIA stream and can receive b(2) water. There is a San Joaquin River benefit from acquired water associated with VAMP. There is a spreadsheet model for the Stanislaus River	X		X	X	X	X	X	No
Tuolumne River	2b	Fall run Chinook, Steelhead trout	The valley floor reach	Fall run upstream migration is a concern from October through January in years that are less than wet. Fall run downstream migration is an issue from April through June. Merced River flows have benefited from flows for the San Joaquin River. Tuolumne River flows have benefited from flows for the San Joaquin River. The mining pits are being restored. There is a spreadsheet model for the Tuolumne River	X		X	X	X	X	X	No
Merced River	2c (Priority lowered due to hatchery)	Fall run Chinook, and possibly Steelhead trout	The valley floor reach	Fall run upstream migration is a concern from October through January in years that are less than wet. Fall run juvenile downstream migration is a concern from April through June in below normal years. Physical rehabilitation of the stream channel is underway. Merced River flows have benefited from flows for the San Joaquin River. There is a spreadsheet model for the Merced River.	X		X	X	X	X	X	Yes

Appendix: Workshop Notes

Workshop 1, August 2000

SUMMARY OF WORKSHOP TO CONSIDER BIOLOGICAL PRIORITIES FOR ACQUISITION OF INSTREAM FLOWS

Date: Tuesday, August 22, 2000

Time: 9:00AM to 5:00PM

Place: Red Lion Sacramento Inn, Comstock III Room

Meeting Summary:

This meeting was convened to develop a process by which biological priorities for water acquisition for anadromous fish flows can be determined. Three groups of attendees met in breakout groups and developed very similar criteria by which this process may go forward. The Service is in the process of synthesizing the results of these groups to develop a draft approach that will be distributed to each of the meeting participants for review. Subsequent to the distribution of that draft document, a second meeting will be held to review and move forward on refining and finalizing the approach for determining biological priorities for water acquisition. This meeting currently is scheduled for 26 October, 2000. Results of this effort will be combined with hydrologic information, which already has been prepared, and economic considerations, which are being addressed, to direct decisions on water acquisition for anadromous fish. Additionally, committees were identified that will review and refine, as necessary, the October 1996 Draft Acquisition Guidelines; and identify anadromous fish flow targets for tributaries not included in that 1996 document.

I. **Introduction-** Jim McKeivitt and Allan Highstreet

Participants introduced themselves. McKeivitt explained the goals of the meeting: to develop a tool by which water acquisition priorities could be developed for biological needs. Specifically, the focus of this water acquisition effort is on acquisition of water upstream of the Delta (on tributaries to the Sacramento and San Joaquin rivers and mainstem) not for the Delta.

The process includes coordinating hydrologic, biological, and economic considerations for water acquisition. This meeting was focused on the biological considerations.

II. **Background - CVPIA and CALFED Water Acquisition Program Information Needs** Jim McKeivitt and Kathy Freas

McKeivitt and Freas explained progress on project to date including development of hydrologic models that assess characteristics of tributaries of interest. These models include AFRP flow priorities based on the October 1996 Draft Acquisition Guidelines developed for the CVPIA PEIS (referred to as the October 1996 document or AFRP flows, herein) for those tributaries, the degree to which the flows are met

by existing hydrology, and preliminary discussions of economic considerations for water acquisition.

Comments/Questions and Responses:

Comment: AFRP flows are not necessarily ecological in nature. Ecological considerations other than fish should be included, such as fluvial geomorphological processes, other species, etc.

Response: A requirement of the CVPIA is the acquisition of water to augment (b)(2) flows, specifically to meet the needs of anadromous fish species. The model is constructed to accommodate acquisition for any purpose, not just fish flows. We plan to use this model for CALFED acquisitions that are more ecologically focused

Question: Are we comfortable with the validity of AFRP flows.

Response: The AFRP flows are a starting point and will be refined with the assistance of a technical team. (This team was set up later in the meeting.)

III. Purpose of Meeting and Desired Outcome- Jim McKevitt

In addition to prioritization of species, streams, or the development of an alternative method for prioritizing water acquisitions on tributaries, an additional desired outcome of the meeting was acceptance of the October 1996 memo of draft AFRP flow priorities as a starting point for determination of acquisition priorities.

IV. Demonstration - Instream Water Acquisition Model- Ben Everett

Everett presented the instream water acquisition model. The model superimposes AFRP flow requirements on existing hydrologic and operational conditions to assess the degree to which existing hydrology meets flow needs and flows remaining for potential acquisition. The model also allows determination of the effects of various acquisition patterns on storage and deliveries on individual tributaries. Use of model output will be used to guide short-term or annual acquisition and to assess options for long-term acquisition.

Comments/Questions and Responses:

Comments and questions fell into two categories:

1. How specific parameters were treated in the model, and;
2. Policy questions.

Questions: Can the model accommodate changes in variables such as required baseline flows, changes in AFPR flow needs, and operational considerations.

Response: The model is constructed such that changes in parameter values can be easily incorporated (within minutes) to accommodate future changes in requirements or operations.

Question: Can the model be integrated with the CALFED daily Delta model.

Response: This is a monthly and long-term model because that is the level of resolution of the information available and sufficient for determining acquisition patterns. The daily model addresses Delta conditions for which daily data are available and considers operations required to meet Delta standards. The two models address different systems and are used for different purposes. It is possible that output from the acquisition model might be useful as input in some form to the Delta model to assess the affects of water acquisitions on Delta standards, if any.

Following the 22 August meeting, the Service met with Jones and Stokes, who developed the Delta daily model, to review the applicability of a daily model for determining acquisition priorities. The results of that review indicate that, while daily models might appropriate for managing water once it has been purchased, daily information is not the appropriate level of information either available or necessary for water acquisition, at this time.

Questions: What economic strategies are being considered for water acquisition? Annual purchase versus options, etc.

Response: These considerations will be included in the development of the economic portion of the decision model, which is in preliminary stages of development.

V. Identification of Flow Needs and Review of 1996 Draft Guidelines for Allocation of Water-Dan Castleberry

Castleberry presented a review of the 1996 Draft Guidelines for Water Acquisition and the purpose and basis for the development of the document.

Comments/Questions and Responses:

Questions: What will be done to ground truth flow requirements included in the October 1996 document.

Response: This document has always been considered preliminary and to be used only as guidance and will be modified based on additional biological information as it becomes available. During the meeting, volunteers were identified to serve on a work group to review and revise these guidelines. Another group was identified to help determine flow requirements on unregulated tributaries for which no AFPR flows were included in the October 1996 document.

- VI. **Relative Biological Priorities Among Anadromous Species**
- VII. **Relative Biological Ranking Among Streams**



Breakout Groups

Hamilton presented an example process for prioritizing acquisitions based on stock ranking and the basis on which decisions for this ranking was made. Three break out groups were formed with instructions to develop an acquisition priority process using stock rankings(as in the example) or any other criteria. Items 6 and 7 on the agenda were combined and these break out groups worked for the remainder of the meeting.

Independently, all three groups developed a very similar process that uses multiple criteria for inclusion into a decision tree to determine water acquisition priorities. Each of the criteria were then ranked or scored on a scale that was different for each group. In each group, the process was tested on several existing streams to assess its feasibility. The results of breakout groups follow:

GROUP 1 NOTES/STRATEGIES

Group participants:

Marty Kjelson, Paul Ward, Matt Brown, Gary Smith, Veronica Petrovsky, John Burke, Erwin Van Nieuwenhuyse.

Considerations:

Species: Late fall C.S./non-anadromous

Urgency: Quantity & quality of water
-temperature
Dry - 2-3 years? Anadromous

Habitats: Watershed approach
-Streams
-Conditions
-Species of concern

Potential of watershed vs. how it is doing

Use of modeling

Resident Fishes:

Purchased water favors anadromous fishes
Focus on natives

Standard water-year types

"Fish-year types"

Factors for Decision Tree:

Factors for Decision Tree:	Ranking
1. Anadromous* vs. Resident	(2)
2. Exotic vs. Native*	(3)
3. Sensitive* vs. Non-sensitive	(1)
4. All life stages met vs. all life stages not met*	(4)
5. Large streams vs. small streams	(?)
6. Timing, magnitude, duration of impaired flows vs. non-impaired	(?)
7. Recent past production - high vs. low*	(5)
8. Potential production of stream - high* vs. low	(6)
9. Multiple species* vs. single species	(7)
10. Water Rights - long-term* vs. annual	

Maximum number of streams (to be determined - not every stream can be part of this matrix)

Specific Decision Criteria

(* = priority?)

Example:

To be calculated yearly, with 3 = urgent, 2 = medium, 1 = mild

	Calaveras River	Stanislaus River	Yuba River	Stony Creek	Mill Creek
Sensitive	3	2	5	2	4
Anadromous	A	A	A	A	A
Native	yes-1	yes-1	yes-2	yes-0	yes-3
Life Stages Not Met	yes-3	yes-1	no-0	yes-3	yes-2
Low Past Production Extirpation	3	2	1	0	3
Low Past Production Cohort Protection	3	2	2	0	3
High Potential Production (habitat)	3	2	1	1	2
Multiple Species	2	2	3	1	2

Minimum flow Achieved	3	1	1	3	3
Natural Hydrograph Achieved	2	1	1	1	3
Large?	Small	large	large	small	small
URGENCY RANKING	23	14	16	11	25

GROUP 2 NOTES/STRATEGIES

Group Participants:

John Icanberry / Elise Holland / Harry Rectenwald / Craig Fleming / Ted Sommer / Dave Robinson / Dan M.

Considerations:

Population Attributes:

- A. Genetic diversity
 - Maximum diversity of genes in the population
 - Maximizing effective population
- B. Scarcity
 - Susceptibility to impacts/threats
- C. Potential for self-sustaining run
- D. Endemic?
- E. Ecological Importance
- F. Historical year class strength
 - 3 years?

Geographic Attributes:

(ranked high, medium, low)

1. Potential for range expansion
2. Limiting factors (habitat reliability)
3. Anadromous species diversity
 - 4a. Urgency (relative to recent hydrology and other events?)
 - 4b. Opportunity (relative to recent hydrology and other events?)
5. Potential for production capability (<500-1000 individuals)
6. Refugia
7. Sustainability
8. Endemic/historical occurrence

Examples:

Streams

Population Attributes

	A	B	C	D	E	F
ST	/	/			/	
WR	/	/	/		/	
SR						

Streams

Geographical Attributes

	1	2	3	4a	4b	5	6
Yuba		/		/			
Clear	/		/			/	/
Clear	H	M	M	H	H	H	M
Yuba	H	H	H	H	M	H	H

1. By watershed
2. Then by species
3. Then revisit on a yearly basis

Another step: temporal opportunities

GROUP 3 NOTES/STRATEGIES**Group participants:**

Alice Low / Serge Birk/ Rod Fujita / Bruce Oppenheim / Tim Heyne

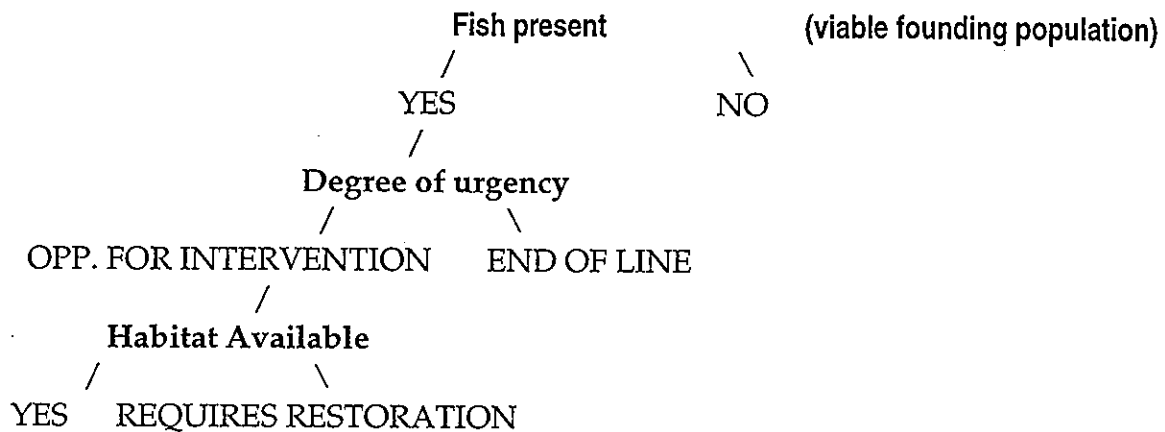
Considerations:

- Multi-species benefits
- Multiple life stage benefits
- Cumulative benefits
- Impacts to other species (Delta species)
- Secondary benefits (water quality, temperature)
- Ecosystem benefits
- Get away from prioritizing by species
- Need to maintain genetic diversity/maintain habitat geographically to distribute production between streams

Set up decision tree based on:

1. Fish presence (real time monitoring)
[1 - 10]
1 sp or 3 by ESA, spring-run, STD, fall-run?
2. Degree of urgency (time)
3. Current habitat availability (Need for habitat improvements)
[0 = no habitat, 10 =]
4. Opportunity for long-term follow through to protect year classes
5. Water deficit
6. Geographical priority

Examples:



	Current Habitat Avail.	Water Deficit	Fish Presence Current Production	Fish Presence Potential for Improvement	Opportunity for Long- Term Protection	Degree of Urgency
scale	(1-10)	need vs. current	(1-9)	(1-9)	(1-10)	
Mill	8	5	7	5	8	9
Cotton wood	7	?	8	3	1	2

Workshop 2, November 2000

MEETING NOTES

WATER ACQUISITION FOR INSTREAM FLOW MEETING - NOVEMBER 6, 2000 SACRAMENTO NATIONAL WILDLIFE REFUGE

PURPOSE:

To develop a tool to evaluate water purchase options and establish priorities.

Following introductions, Jim McKevitt discussed a stream proposal he had developed. Jim's model was based on the Habitat Evaluations Procedures often used in terrestrial situations the model is simple and easy to use. It requires the placement of a rank value on species and an evaluation of the potential for an increase in production for the species.

The equation then becomes Species Rank Value X potential for increase = Score.

For example, Fall Run Chinook = 0.4

A potential to increase the population by 20% would result in:

$0.4 \times .20 =$ a score of .8

Spring Run $0.8 \times .20 = 1.6$, etc.

In group discussion, it was generally agreed that simply relying on a production model would overlook ecological process restoration values and would not take into account existing or anticipated benefits from investments in stressor reductions and habitat restorations.

Another suggested method would be the use of risk or risk reduction as a means to establish priority. This technique would involve developing some sort of metric which describes the level of risk to the various species associated with not taking action to augment in-stream flow. For example: if informed biologists concluded there was a 98% probability that a certain population of an at risk species would drop below an established population level, then that population would be assisted with flow augmentation. The group agreed that this approach had merit and was always in the minds of resource managers, but was quite subjective and single species focused.

Many at the work meeting emphasized that the acquisition of permanent water rights was a priority. This need was acknowledged and will be documented as an acquisition priority.

In breakout sessions, the two groups developed their own models for reaching priorities. Figures 1 and 2 diagram these models. The first is a series of yes/no decisions starting with the basic hydrology of the stream, then moving to ranking of in-stream flow as a limiting factor and then looking at the potential for multiple species benefits. The second approach would start with an array of the now limiting factors and would spread its priority allocations to streams with relatively few limitations other than flow, and to streams where restoration potential could be measured with metrics like acres of habitat restored per acre/foot allocated.

Streams would be divided into those providing habitat for endangered species, where the focus would be on preservation, and streams without endangered species, where the focus would be on restoration.

Both teams then conducted an exercise to test their models. In Table 1, the results of a “mock” application of the decision tree model are displayed. Question 1 relates to the presence of base minimum flow. Question 2 asks whether or not the lack of flow is an “overarching” benefiting factor, and Question 3 identifies the anadromous fish species present with emphasis on those at risk.

Table 2 displays the results of a “sticky dot” exercise, where each person voted on his or her priority stream using his or her knowledge of the stream, its limiting factors and its ability to support anachronous species.

The group was pleased to note the similarity in results.

NEXT STEPS:

The group concluded that a workshop to use these models was necessary. They suggested that more experts and more written resources be available.

Proposed dates for the workshop were December 11 or 18 in Sacramento.

Additional experts will be invited and all will be provided with the recommended background material in advance. Dick Daniel will coordinate contact with the additional experts. If you have suggestions, please call him at 916/920.0300 or ddaniel@ch2m.com.

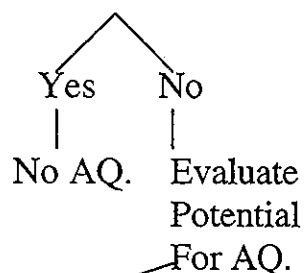
Figure 1

Start w/Hydrology

Existing vs. Unimpaired

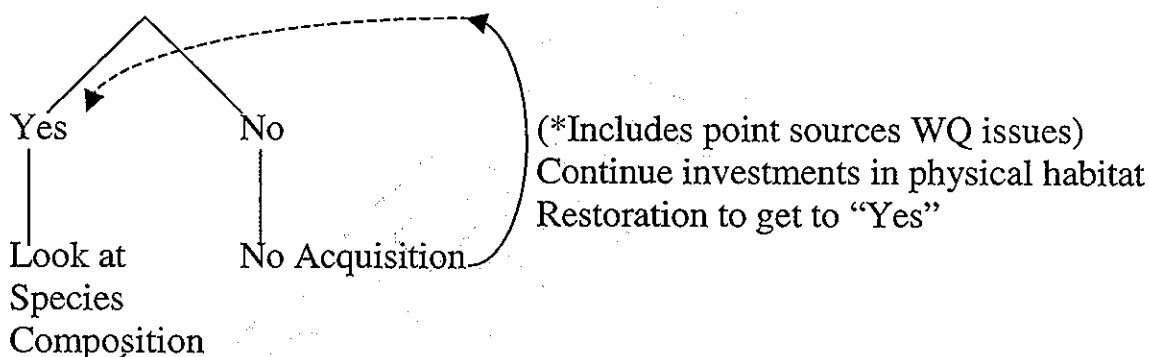
- How far off are flows?
- Ultimately, goal is to move towards unimpaired

1) Is minimum flow being met?

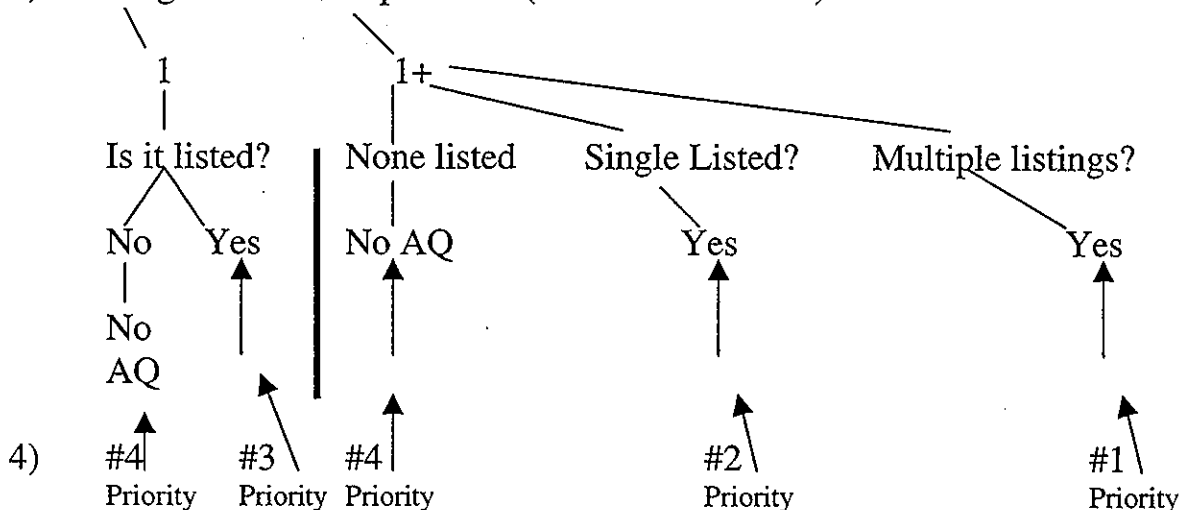


*H₂O AQ not necessary because min. met (e.g. Sac Feather American)

2) Lack of flows thought to be overarching limiting factor?



3) Single SP or multiple SPP? (Presence in stream)



4) #4 Priority #3 Priority #4 Priority

#2 Priority

#1 Priority

Table 1

APPROACH #1
PRIORITY RESULTS

	Q1	Q2	Q3
Deer	N	Y	1+ (ST, SR, Listed) (#1)
Merced	Y	N	
Bear	N	N	
Stanislaus	N	Y	1+ (ST) (#2)
Calaveras	N	Y	1+ (ST(#2)
Battle	N	N	
Mokelumne	Y	--	
Butte	Y	--	
Antelope	N	N	
Mill	N	Y	1+ (SR, ST) (#1)
Yuba	Y	--	
Cottonwood	Y	--	
Tuolumne	N	Y	

Figure 2

APPROACH #2

LIMITING FACTORS (WORKING PAPER)

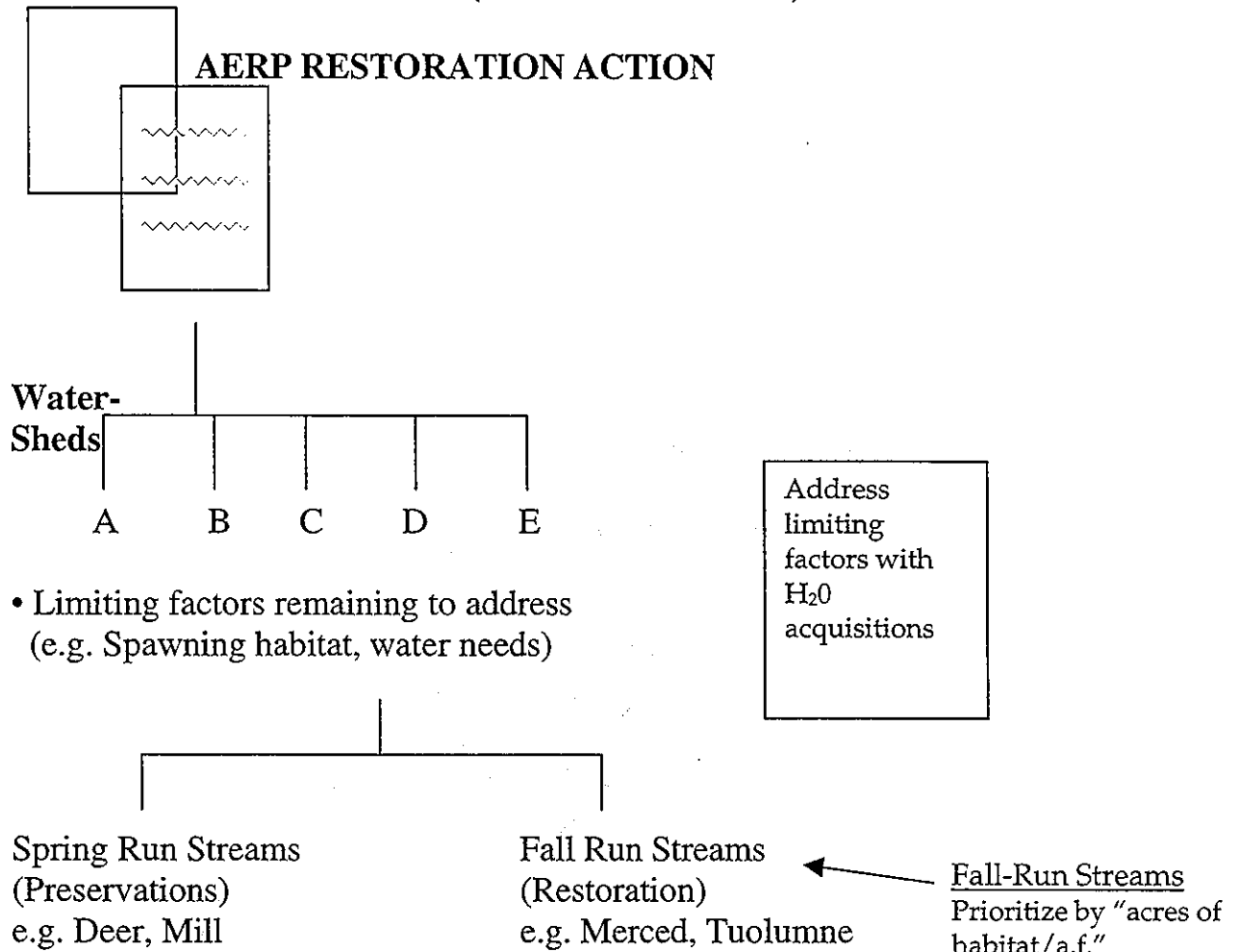


Table 2**STICKY DOT VOTING RESULTS**

#1	Mill A	←	→	Mill
	Deer A	←	→	Deer
#2	Calaveras	←	→	Calaveras
#3	Clear			Stanislaus
#4	Butte Co.			
	Tuolumne	←	→	Tuolumne
#5	Cosumnes			
	Stanislaus			
#6	Battle			
#7	American			
	Antelope			
	Merced			
#8	Big Chico			
	Cottonwood			
	Cow			
	Stony			

(Bear #3; Antelope 9; Yuba 11; Feather 21)

Workshop 3, February 2001

MEETING SUMMARY

CH2MHILL

Water Acquisition for Fish and Wildlife Restoration

ATTENDEES:

NAME	AGENCY & ADDRESS	PHONE	E-MAIL ADDRESS
Paul Bratovich	SWRI, 455 Capitol Mall, #600	916/325.4044	bratovich@swri.net
Dan Meier	USBR, 2800 Cottage Way, 95825	916/978.5559	dmeier@mp.usbr.gov
Kathy Freas	CH2M HILL, 2485 Natomas Park Drive, #600	916/920.0300	kfreas@ch2m.com
Mark Tompkins	CH2M HILL, 2485 Natomas Park Drive, #600	916/920.0300	mtompkin@ch2m.com
Alice Low	DFG, 1807 13 th Street, 95818	916/327.8848	alow@dfg.ca.gov
Serge Birk	CVPWA	530/529.4334	sergebirk@msn.com
Rod Fujita	Environmental Defense	510/658.8008	rfujita@environmentaldefense.org
Dan Castleberry	USFWS	916/414.6533	dancastleberry@fws.gov
Michael Bryan	RBI	916/714.1802	bryan@robertson-bryan.com
John Icanberry	USFWS-AFRP	209/946.6400	john_icanberry@fws.gov
Roger Guinee	USFWS	916/414.6535	roger_guinee@fws.gov
Erwin Van Nieuwenhuyse	USFWS-AFRP	209/946.6400	evannieu@delta.dfg.ca.gov
Tim Heyne	CDFG	209/853.2533	theyne@dfg.ca.gov
Elise Holland	TPL	415/495.5660	elise.holland@tpl.org
Dick Daniel	CH2M HILL, 2485 Natomas Park Drive, #600	916/920.0300	ddaniel@ch2m.com
Tim Rust	J&S	916/737.3000	timrust@jsanet.com
Dick Jewell	USFWS	916/414.6536	richard_jewell@fws.gov
Andy Hamilton	USFWS	916/414.6540	andrew_hamilton@fws.gov
Allan Highstreet	CH2M HILL, 2485 Natomas Park Drive, #600	916/920.0300	ahighstr@ch2m.com

FROM: Mark Tompkins/CH2M Hill
Kathy Freas/CH2M Hill

DATE: February 7, 2001

Allan Highstreet / CH2M Hill facilitator, gave a brief overview and introduction to the meeting.

Dan Castleberry discussed FWS organization changes. The Service has merged CVPIA and CALFED and implemented a structure to facilitate integration. Dan now leads the Project Implementation Division and Roger Guinee leads the Water Acquisition Division.

EXPECTATIONS (Castleberry)

The purpose of this meeting is to apply the process developed at the last meeting to begin to identify priorities among streams for water acquisition at a gross level. The other purpose, and perhaps the most important one, is to refine and improve the process and then decide on "where we go from here." Dan added the caveat that CH2M HILL's contract for this effort is coming to an end, so the group may be able to identify the next steps, but the timing for action on those steps may have to be determined later.

BACKGROUND AND CONTEXT (Freas)

The purpose of this meeting is to prioritize acquisition of water for the (b)(3) program. Section 3406(b)(3) directs Interior to develop a program to acquire water for restoration of anadromous fish. Because there are limited funds available to acquire water, the acquisition program needs biological guidance so that the acquisitions provide the maximum possible benefit.

The approach to prioritizing flow acquisitions based on several years of work and refined previous meetings was founded on the idea that water acquisitions need to be based on the following three requirements:

- 1) Biological needs
- 2) Hydrologic considerations (including operations)
- 3) Economic considerations

The draft guidelines prepared by the Service address the biological needs for some streams. Hydrologic information was compiled in 1998 and 1999 and includes information on hydrology, water rights, and operations. In addition, a recent effort developed spreadsheet models that overlay AFRP flow priorities with hydrology information for all water year types to identify water needs. These models illustrate how expected flows meet stated needs for each stream system. The models are available for all of the streams where hydrology models were developed. An approach to incorporating economics (i.e. carryover of dollars, conditional acquisition, teaming for flow acquisition) is in the early development stages. Are the 1996 guideline flows or desirable flows for which there are no guidelines are there adequate flows.

ORIGINAL APPROACH

The prioritization approach developed in the last meeting consisted of the following three questions:

- 5) Are 1996 Guideline flow priorities, or desirable flows for streams not included in the Guidelines, met by existing flows?

IF YES: NO ACQUISITION

IF NO: GO TO QUESTION 2

- 6) Are there limiting factors that preclude benefits from increased flows?

IF YES: CONTINUE INVESTMENTS IN PHYSICAL HABITAT RESTORATION TO GET TO NO

IF NO: GO TO QUESTION 3

- 7) Will a single or multiple species benefit from acquisitions?

IF MULTIPLE LISTED SPECIES: PRIORITY = 1

IF MULTIPLE SPECIES, ONE LISTED: PRIORITY = 2

IF ONE LISTED SPECIES: PRIORITY = 3

IF MULTIPLE SPECIES, NONE LISTED: PRIORITY = 4

IF ONE SPECIES, NONE LISTED: PRIORITY = 4

QUESTION 1 DISCUSSION

Serge Birk noted that the first question had been changed from what was developed in the original meeting. Serge also asked which streams do not have guidelines and voiced concern that all the streams should be compared against the same basis. He said it was important that this effort not lose sight of the fact that minimum flows set for streams were related to biological needs. Serge offered later in the discussion that there is probably no stream in the Central Valley where all of the ecological needs are met, so why ask question one at all?

Dan responded that the first question was changed to avoid acquiring flows just to meet minimum regulatory requirements.

Serge then suggested that this effort get away from the 1996 document and work on all streams in the same light that considers the biological triggers and needs of each stream. Otherwise this process could confuse policy makers and decision makers. Serge's basic assertion was that this effort prioritize all the streams up for flow acquisition on the same basis. Serge noted that part of this effort is rooted in the 1996 study, but the 1996 study does not take into account many of the changes that have occurred since that time. For example, Clear, Battle, and Butte Creek all have more water now than in 1996. Therefore, the 1996 guidelines and needs might be different now.

Kathy responded that the 1996 Guidelines were being used here only as a starting point for this process.

Serge recommended rewording the first question as follows:

ARE THE FLOWS REQUIRED FOR BIOLOGICAL NEEDS FOR THESE FISH IN THESE STREAMS BEING MET?

Dan suggested the following alternative to the first question:

ARE ECOLOGICALLY DESIRABLE FLOWS MET BY EXISTING FLOWS?

Dan added that documenting how we answer that question will be critical. This rewording of question 1 was accepted by the group.

QUESTION 2 DISCUSSION

Serge suggested that we ask if water is the principal constraint? He also suggested that we add "at this time" to Question 2.

Roger Guinee clarified Question 2 by saying it really asks if there are constraints that would limit the benefits of additional water.

Dan cited the Tuolumne River as a good example of a system where there were other problems (e.g. gravel pits) that would limit the benefit of additional water, but water was added and still resulted in significant benefits.

Dan also noted that today's meeting was meant to advance this management tool, not finish the decision making process, and that we should go away from here with ideas for refinements and improvements to the prioritization process.

QUESTION 3 DISCUSSION

Serge suggested that Question 3 include an “extinction factor” of some sort. That is, if there is only one listed species in a particular stream, but it is ecologically significant valley-wide or has a greater relative contribution (San Joaquin improvements vs. Sacramento improvements) to restoration of the species, that system might warrant a higher priority than would be awarded by this question.

Kathy reminded the group that this tool is meant to be gross and will be implemented by biologists who are experts in their stream systems. Roger reinforced Kathy’s point by saying that documentation will definitely occur as these flow acquisitions are made. Kathy continued by saying that multiple tributaries will likely be selected at each priority level and that this is just a gross tool to provide a template for decisions.

Elise Holland commented that this effort is mainly geared to AFRP (b)(3) water and does not specifically address CALFED program goals. She asked for clarification of what CALFED is looking for in terms of ecosystem restoration.

Dick Daniel offered some comments from the CALFED perspective and said that by changing Question 1 as proposed we are getting at the ecosystem restoration goals of CALFED. Dick also noted that the synergy element coming up in these discussions (e.g. considering flows in tributaries to improve San Joaquin flows) is also in line with CALFED goals. He said that this prioritization tool is intended to be a simplistic, transparent process that stimulates discussion rather than dissention.

MISCELLANEOUS DISCUSSION

Serge noted that some of the ecological benefits required by CALFED are not as entwined in the AFRP goals and that should be considered in the development of this process.

Erwin Van Nieuwenhuyse asked for some clarification of how we will quantify the results of allocating water according to this system. Erwin said that we need to use the existing water infrastructure in California to our advantage in this process.

Serge noted that without understanding the entire system, how can we begin to prioritize where water acquisition will have the most impact. The reality is that there is an element of uncertainty when a decision to buy water is made.

Kathy responded by saying that the intent of this process was to be transparent and defensible to buy water according to biological expertise. John Icanberry said that eventually the benefits of acquired water will be investigated and therefore it is important that we base acquisition decisions on a biologically sound approach.

Dick Daniel said that CALFED is working on a monitoring framework – there are performance and biological monitoring requirements. We put a package together for the Service that ties projects completed to performance and biological monitoring options.

Mike Bryan suggested incorporating ecosystem and synergistic factors into the decision tree.

BREAKOUT GROUPS– The breakout groups were tasked with refining Question 3 and considering additional questions for the prioritization process.

GROUP 1

Alice Low presented the results of the discussions in Group 1. Group 1 decided to keep Questions 1 and 2 intact. However, they would change question 3 to include listed species

affected by flow (not just anadromous fish). They also suggested adding the following two new prioritization questions -

- 4) How important is the stream for restoration of one or more listed species (considers genetic integrity, sustainable production, potential extinctions, potential productions)?
- 5) What is the degree to which flows are limiting (considers potential geomorphic benefits, potential fish habitat benefits)?

Dick voiced concern over a screening process based on "potential production" as stated in Question 4. He felt this could lead to decisions to just grow more fish.

GROUP 2

Mike presented the results of the discussions on Group 2. Group 2 also decided to keep questions 1 and 2. Group 2 focused on questions 3 and wrestled with keeping the existing prioritization and just adding a fourth step, or tiering off of the species prioritization questions with an "a,b,c" breakdown related to ecosystem benefits. They settled on the "a,b,c" approach and added a "filter process" to be applied after the three questions to look at downstream benefits, multiple species benefits, and other ancillary benefits. Their rankings break down as follows:

1A = Multiple listed species, geomorphic improvement (GI), more than one ecosystem benefit (EB)

1B = Multiple listed species, no GI, 1 EB

2A = Multiple species, 1 listed, GI, more than 1 EB

2B = Multiple species, 1 listed, no GI, 1 EB

3A = Single listed species, more than one EB

3B = Single listed species, 1 EB

4A = Multiple species, none listed

4B = No listed species

PRELIMINARY STREAM PRIORITIZATIONS

The breakout groups assembled again after lunch to rank the streams according to their systems. The groups were tasked with making a first cut at prioritizing the streams.

GROUP 2 ranked the streams as follows:

1A - No streams

1B - Deer, Mill, Clear, Yuba, Butte, Battle, and Feather

2A - American River

2B - Merced, Cottonwood, Stanislaus, Mokelumne, Calaveras, Big Chico, Tuolumne

3A - No streams

3B - No streams

4A - No streams

4B - Cosumnes, Cow, Antelope, Bear

Group 2 then applied their filter and prioritized within the rankings by assessing ecosystem benefits of added water. Dick Daniel noted that in some systems, added water will be able to affect more of the ecosystem than in other systems. For example, the high quality spawning habitat in some streams that could benefit from more water is above all diversions.

Group 2 also filtered for the influence of hatchery fish on the system.

Group 2 didn't consider splittail or Delta smelt

GROUP 1

Group 1 did not eliminate any streams based on Questions 1 or 2. They had a fish focus when asking question 3, and listed the streams and the number of listed species in each stream (included splittail and Delta smelt) to begin their ranking process. Next, group 2 asked their Question 4 and assigned High, Medium, and Low (H,M,L) values to the four points listed in Question 4 (considers genetic integrity, sustainable production, potential extinctions, potential productions). They then assigned numbers to the H,M, and L values and summed them to get rankings. Because of time constraints Group 2 did not finish their rankings. Group 2 didn't have time to get to the geomorphic considerations tier of the ranking system.

Dan also listed some of the concerns his group had about why this process did not work too well. The concerns are listed below.

The process required too much detail. There was insufficient accuracy in the data used to make the decisions

This method was too focused on species status

DOES THE PROCESS WORK?

Serge suggested including the filtering or weighting step at the start or the end of this process.

Rod suggested adding uncertainty to the filtering process (e.g. a more certain small benefit might be better than an uncertain large benefit).

Serge noted that the view of environmental groups and farmers is that people should consider how EWA water might meet some of the upstream needs. Also, EWP water should consider upstream needs.

Dick Daniel mentioned that EWP water could offset water in Shasta, for example. EWA water does not have the same flexibility and range of benefits as EWP water.

WHERE DO WE GO FROM HERE???

Dick Daniel suggested that we could use either system to prioritize water acquisitions.

The systems will be summarized and sent out for review among the groups so that "this leg of the stool" can be firmly set in place. The notes on the prioritization systems will be compiled along with the needs for further refinement of the system. We should make sure to carry forward the momentum that has developed over the past three meetings on this issue.

Erwin suggested we compare results of today's ranking with last meeting's ranking.

ACTION ITEMS:

Group volunteers (Dick Daniel and Dan Castleberry) prepare brief summaries of breakout group discussions and details of their ranking systems.

E-mail list of attendees to the group.

Compile meeting summary notes with breakout group summaries and distribute the package to the entire group.

Workshop 4, July 2001

TECHNICAL MEMORANDUM

CH2MHILL

Summary and Results of the CVPIA 3406 (b)(3) Flow Acquisition Prioritization Process

PREPARED FOR:

- Mike Tabault/USFWS
- Roger Guinee/USFWS
- Dick Jewell/ USFWS
- Jeff Phipps/WAPA Consultant
- Erwin Van Nieuwenhuyse/AFRP
- Andy Hamilton/USFWS
- John Icanberry/AFRP
- Dan Meier/USBR
- Harry Rectenwald/CDFG
- Elise Holland/TPL
- Alice Low/CDFG
- Serge Birk/CVPWA
- Marylee Knecht/J&S
- Tim Heyne/CDFG
- Todd Manley/NCWA
- Dick Daniel/CH2M HILL
- Allan Highstreet/CH2M HILL

PREPARED BY:

- Kathy Freas/CH2M HILL
- Dick Daniel/CH2M HILL

DATE: August 3, 2001

This memorandum provides a summary of results of the fourth and final workshop to develop and implement a process to prioritize tributaries to the Sacramento and San Joaquin river for flow acquisition.

This workshop, one of four beginning in August 2000 is part of a process undertaken by Department of Interior and their consultant, CH2M HILL, and stakeholders to develop and implement a system to acquire instream flows for restoration of anadromous fish populations in accordance with the Central Valley Project Improvement Act (CVPIA) subsection 3402 (b)(3). Participants in the fourth workshop of the (b)(3) acquisition program ranked 19 tributaries to the Sacramento and San Joaquin rivers for instream flow acquisition based on biological criteria. Tributaries considered include Feather, Bear, Yuba, American, Mokelumne, Calaveras, Stanislaus, Tuolumne, Cosumnes, and Merced rivers; Battle, Mill, Deer, Butte, Cow, Big Chico, Cottonwood, Big Chico, Antelope, and Clear creeks.

A separate document is available that chronicles in more detail the entire process of developing flow acquisition priorities, including information regarding hydrologic and operational conditions and economic approaches to flow acquisition.

It is important to note that these rankings are draft and are the result of discussion and focused assessment of acquisition priorities by agency and stakeholder biologists. As such, they intended to be used for general guidance only and in conjunction with a set of several spreadsheet models that have been developed to provide more quantitative guidance for acquisition of desirable flows on regulated tributaries. *For tributaries for which spreadsheet models exist, no acquisitions should be planned based on the rankings below until model predictions of flow needs are consulted.* * indicates tributaries for which spreadsheet models are available.

Tributaries were ranked as follows based on species and ecosystem benefit criteria:

- 1a: multiple listed species, > 1 ecosystem benefit
No tributaries are included in this ranking
- 1b: multiple listed species, \leq 1 ecosystem benefit
Mill Creek, Deer Creek, Butte Creek, Yuba River*
- 1c: 1a or 1b, hatchery present
Battle Creek
- 2a: multiple species, 1 listed, > 1 ecosystem benefit
No tributaries are included in this ranking
- 2b: multiple species, 1 listed, \leq 1 ecosystem benefit
Clear Creek, Antelope Creek, Cow Creek, Big Chico Creek,
Calaveras River, Stanislaus River*, Tuolumne River*
- 2c: 2a or 2b, hatchery present
Feather River*, American River, Mokelumne River*, Merced River*
- 3a: 1 listed species, > 1 ecosystem benefit
No tributaries are included in this ranking
- 3b: 1 listed species, \leq 1 ecosystem benefit
No tributaries are included in this ranking
- 3c: 3a or 3b, hatchery present
No tributaries are included in this ranking
- 4a: multiple species, none listed
No tributaries are included in this ranking
- 4b: 1 species, none listed species
Cottonwood Creek
Cosumnes River
Bear River

Decisions regarding acquisitions among tributaries ranked within a category could be based on additional biological information, some of which is included in Table 1 of this document, or economic considerations. This ranking is intended to be dynamic and should be updated as conditions change, particularly as habitat restoration programs on individual tributaries increase the value of acquired flows. Additionally, a systematic effort to develop within-tributary desired fish flows (similar to those for regulated tributaries included in the October 1996 memo (USFWS, 1996) for nonregulated tributaries is desirable to direct amounts and timing of acquisition for these tributaries. Currently, all 1b ranked tributaries and the majority of 2b ranked tributaries lack defined within-tributary desired fish flows.

These preliminary results will be provided to the EWP at their 23 August meeting. These result are only to be used as a general guide for flow acquisition. Specific decisions

regarding acquisitions will be determined using tributary-specific models, where available, and considerations included in Table 1 of the Summary Technical Memorandum.